

Claims

[c1] WHAT IS CLAIMED IS:

1. A proportional solenoid valve for a camshaft adjusting device of motor vehicles, the proportional solenoid valve comprising:

a valve housing;

a piston movably arranged in the valve housing and provided with at least one pressure medium passage;

a solenoid part connected to the valve housing and acting on the piston;

the valve housing having at least one working connector, a tank connector, and a pressure connector configured to supply a pressure medium into the piston;

one or more leakage passages connecting the pressure connector at all times to the at least one working connector.

[c2] 2. The valve according to claim 1, wherein the one or more leakage passages are provided in the piston.

[c3] 3. The valve according to claim 1, wherein the one or more leakage passages are provided in the valve housing.

- [c4] 4. The valve according to claim 1, wherein the piston is a hollow piston having a wall and wherein the at least one pressure medium passage is at least one opening penetrating the wall.
- [c5] 5. The valve according to claim 4, wherein several of the openings penetrating the wall are provided and wherein a first and a second one of the working connectors are provided, wherein the first and second working connectors each have at least one of the openings penetrating the wall correlated therewith.
- [c6] 6. The valve according to claim 5, wherein the first and second working connectors each have at least one of the leakage passages connecting the first and second working connectors to the pressure connector at all times, respectively.
- [c7] 7. The valve according to claim 6, wherein the at least one leakage passage of the first working connector and the at least one leakage passage of the second working connector have identical flow cross-sections.
- [c8] 8. The valve according to claim 6, wherein the at least one leakage passage of the first working connector and the at least one leakage passage of the second working connector have different flow cross-sections.

- [c9] 9. The valve according to claim 1, wherein the at least one leakage passage is a nozzle.
- [c10] 10. The valve according to claim 1, wherein the one or more leakage passages are openings penetrating a wall of the piston.
- [c11] 11. The valve according to claim 1, wherein the one or more leakage passages are comprised of openings provided in the valve housing.
- [c12] 12. The valve according to claim 11, wherein the valve housing has a land between the at least one working connector and the pressure connector and wherein the one or more leakage passages are bores in the land.
- [c13] 13. The valve according to claim 1, wherein the one or more leakage passages are an orifice.
- [c14] 14. The valve according to claim 1, wherein the piston has several of the leakage passages distributed circumferentially about the piston.
- [c15] 15. The valve according to claim 1, wherein the one or more leakage passages are positioned adjacent to the at least one pressure medium passage.
- [c16] 16. The valve according to claim 1, wherein the piston

has a closed bottom and wherein the solenoid part has a plunger, wherein the closed bottom of the piston rests against the plunger.